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to be exempted from taxation (p. 164). There are, however, two local assessment rolls preserved (Exchequer Lay Subsidies 242/47, 242/127) which contain accurate information concerning the movables that were taxed. The summary of the accounts rendered by the collectors of the subsidy of 1232 (L. T. R. Foreign Accounts, Roll 1, m. 6) throws a flood of light upon the system of exemption and separate payment. For neither of the subsidies have these records been utilized and there are similar omissions elsewhere.

There are many repetitions in the first part of the work, due to the method of treatment and, therefore, to be pardoned. The style is rather dry. On every page, however, there is evidence of a mastery of most of the pertinent original material. Though neither in purpose nor in result a book for the general reader, it is a very valuable guide to the taxes of the thirteenth century.

JAMES F. WILLARD.

Roger Bacon Essays. Contributed by various Writers on the Occasion of the Commemoration of the Seventh Centenary of his Birth. Collected and edited by A. G. LITTLE. (Oxford: Clarendon Press. 1914. Pp. 425.)

FOURTEEN essays are contributed by as many scholars from various fields of natural science, mathematics, medicine, literature, linguistics, philosophy, palaeography, and artillery. An appendix of fifty pages gives in revised form the bibliography of Bacon's writings published by Mr. Little in 1911. There is no index. Of the essays, four are written in German; two in French; one, by an American, Professor David Eugene Smith. Of the contributors five have been or are engaged in editing Bacon's writings; others have previously published books or articles concerning him; others are authors of general histories of the departments of learning to which they now estimate Bacon's contributions or relations.

"One is liable", writes Professor Smith, "to be led away by enthusiasm when writing upon the occasion of the seven hundredth anniversary of any great leader, to read into his works what is not there, and to ascribe to him abilities which he never possessed" (p. 182). This tendency, however, most of the essayists have successfully resisted; and, while there is a certain amount of the eulogy inevitable upon such an occasion, one lays down the volume convinced that its authors have damned Roger Bacon with faint praise, and that his reputation, like Pyrrhus's army, will hardly stand another such anniversary. Their careful examination of writings by Bacon, which have recently been brought to light in manuscript form or are difficult of access in rare old editions, has failed to add much to his stock of ideas found in the now familiar *Opus Maius* and *Opus Tertium*, and cannot be very encouraging to those trying to raise a fund for the publication of all his works. His

indebtedness to others for many of the ideas on which his fame has rested is indicated, not only by the reaffirmation by the German writers on his Optic of its derivation from the Arab Alhazen (Ibn al Haitam), but by the essay of Professor Baur, who has recently edited the philosophical writings of Robert Grosseteste, upon the latter's influence on Bacon. He asserts that "many laurels" from Roger's "wreath of fame" really belong to Robert, with whose writings Bacon's sometimes coincide verbally. Throughout the volume Bacon's mistakes and superstitions are noted, and, while some writers still regard his trust in experience as marvellous for his times, others make strictures upon his "experimental science". Mr. Pattison Muir admits that Bacon "was not altogether happy in his treatment of what we now call chemical changes. He does not appear to have studied these events much at first-hand. He followed the footsteps of others" (p. 318). Duhem, treating of Bacon's physics, says, "On aime à faire de Roger Bacon un adepte précoce de la méthode expérimentale; des pages comme celles-ci nous montrent assez qu'il expérimentait seulement en imagination." Duhem also illustrates the inane scholastic meanderings in which Bacon's physics could indulge. Dr. Withington gets little of value out of Bacon's medical treatises. Professor Smith, after a survey of "the mathematics of Bacon's time", concludes that he was not justified "in assuming the attitude of superiority which he showed towards most of his contemporaries" (p. 182), that "he contributed nothing to the pure science" (p. 171), and that "mathematics meant to him little more than astronomy" (p. 173). Smith should say "astrology".

Two essays should be mentioned as of different scope from the others. Sir John Edwin Sandys writes on "Roger Bacon in English Literature". Mr. A. G. Little's Introduction gives an excellent moderate statement of the facts of Bacon's life. The only instances where he seems to err are in following the authority of Father Mandonnet at pages 8-9 and 25. Another valuable feature, which his essay shares with several others, is the demonstration that Bacon's writings were not almost forgotten for centuries but exerted a continuous influence.

The chief criticism which may be made of this book is that several essays, unlike those of Baur and Smith, are mere presentations of Bacon's views without sufficient evidence to enable us to estimate his comparative importance. Thus, Dr. Hirsch, while granting that Bacon was no modern comparative philologist, asserts that he was distinctly superior to his contemporaries, but gives us no references to them. Of three German physicists who contribute papers, Dr. Würschmidt merely describes the treatise *De Speculis*; Dr. Vogl's references are exclusively to Brewer's and Bridges's familiar editions of Bacon's works; and Professor Wiedemann's sole note is to Würschmidt's paper. Vogl even appears to have embodied several of Bridges's notes in his paper: compare Vogl, page 214, line 33, with Bridges, II. 428, note 1; Vogl, page 216, lines 22-27, with Bridges, II. 431, note 1; Vogl, page 220, line 25, with Bridges,

II. 46, note; Vogl, page 221, lines 17-25, with Bridges, II. 67, marginal topic, and II. 68, note 1.

I cannot accept the main theses of two essays, namely, Professor Duhem's "Roger Bacon et l'Horreur du Vide", and Colonel Hime's "Roger Bacon and Gunpowder". The physical theory which Duhem credits Bacon with inventing is set forth in chapter LVIII. of the *Quaestiones Naturales* of Adelard of Bath, written over a hundred years before Bacon's treatises. Colonel Hime tries to prove Roger Bacon the inventor of gunpowder by the method which has been employed to prove Francis Bacon the author of Shakespeare's plays—a cipher; but other considerations than the cipher itself invalidate his conclusions. I hope to deal with these two methods elsewhere more fully than present space permits.

A few errors of detail should be noted. In note 1 on page 71 the reference should be to *Moyen Âge*, November, 1894, instead of 1891. One finds the spelling "Pecham" on pages 24, 28, and 235; "Peckham" on 152 and 159. I cannot find the phrase "*homo sapientissimus*" in the passage cited by Hirsch (p. 139); and Hirsch's logic in the two following pages would excite the derision of Bacon's "scholastic contemporaries". Smith (p. 157) incorrectly dates Adelard of Bath about 1180—perhaps a slip for 1130. At pages 262 and 263 we find described two different "troisième expériences"; one of them should be changed to "second" or "fourth". Breaks in quotations are not always indicated by dots (*e. g.*, page 165, line 3, after "attained"); and one is never sure whether the passages set up in close type are true quotations or not. Vogl seems the chief offender in this respect. He runs together passages from 40 to 400 pages apart in Bridges's text and indiscriminately juxtaposes exact translation and loose paraphrase and condensation of Bacon's wording. Moreover, the passage on pages 225-226 for which the foot-note cites Bridges, II. 78, 92, is mainly from Bridges, II. 52-53. Dr. Withington's digression into the history of astrology (pp. 343-345) contains two or three misleading statements.

LYNN THORNDIKE.

The Place of the Reign of Edward II. in English History. Based upon the Ford Lectures delivered in the University of Oxford in 1913, by T. F. TOUT, M.A., F.B.A., Bishop Fraser Professor of Medieval and Ecclesiastical History. [Publications of the University of Manchester, Historical Series, no. XXI.] (Manchester: The University Press. 1914. Pp. xvi, 421.)

ONE of the greatest needs in English history is a careful study of the administrative system in the later Middle Ages. Anyone who has investigated this period, though never so slightly, is aware of the many unsolved problems which now stand in the way of a thorough understanding of the constitutional development. There is no field in which